Outboard Care

To keep your outboard in the best operating condition, it is important that your outboard receive the periodic inspections and maintenance listed in the Inspection and Maintenance Schedule. We urge you to keep it maintained properly to ensure the safety of you and your passengers, and retain its dependability.

WARNING

Neglected inspection and maintenance service of your outboard or attempting to perform maintenance or repair on your outboard if you are not familiar with the correct service and safety procedures could cause personal injury, death, or product failure.

Record maintenance performed in Maintenance Log at the back of this book. Save all maintenance work orders and receipts.

SELECTING REPLACEMENT PARTS FOR YOUR OUTBOARD

We recommend using original Mercury Precision or Quicksilver replacement parts and Genuine Lubricants.

A WARNING

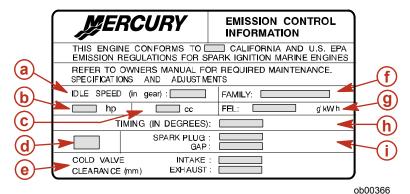
Using a replacement part that is inferior to the original part could result in personal injury, death, or product failure.

EPA Emissions Regulations

All new outboards manufactured by Mercury Marine are certified to the United States Environmental Protection Agency, as conforming to the requirements of the regulations for the control of air pollution from new outboard motors. This certification is contingent on certain adjustments set to factory standards. For this reason, the factory procedure for servicing the product must be strictly followed and, wherever practicable, returned to the original intent of the design. Maintenance, replacement, or repair of the emission control devices and systems may be performed by any marine spark ignition (SI) engine repair establishment or individual.

EMISSION CERTIFICATION LABEL

An emission certification label, showing emission levels and engine specifications directly related to emissions, is placed on the engine at time of manufacture.



- a Idle speed
- **b** Engine horsepower
- c Piston displacement
- **d** Date of manufacture
- e Valve clearance (if applicable)

- **f** Family number
- g Maximum emission output for the engine family
- h Timing specification
- Recommended spark plug and gap

OWNER RESPONSIBILITY

The owner/operator is required to have routine engine maintenance performed to maintain emission levels within prescribed certification standards.

The owner/operator is not to modify the engine in any manner that would alter the horsepower or allow emissions levels to exceed their predetermined factory specifications.

Inspection And Maintenance Schedule BEFORE EACH USE

- Check engine oil level. See Fuel & Oil Checking and Adding Engine Oil.
- Check that lanyard stop switch stops the engine.
- Visually inspect the fuel system for deterioration or leaks.
- · Check outboard for tightness on transom.
- Check steering system for binding or loose components.

- Visually check steering link rod fasteners for proper tightness. See Steering Link Rod Fasteners.
- · Check propeller blades for damage.

AFTER EACH USE

- Flush out the outboard cooling system if operating in salt or polluted water. See **Flushing the Cooling System**.
- Wash off all salt deposits and flush out the exhaust outlet of the propeller and gearcase with fresh water if operating in salt water.

EVERY 100 HOURS OF USE OR ONCE YEARLY, WHICHEVER OCCURS FIRST

- Lubricate all lubrication points. Lubricate more frequently when used in salt water. See Lubrication Points.
- Change engine oil and replace the oil filter. The oil should be changed
 more often when the engine is operated under adverse conditions
 such as extended trolling. See Changing Engine Oil.
- Replace spark plugs at first 100 hours or first year. After that, inspect spark plugs every 100 hours or once yearly. Replace spark plugs as needed. See Spark Plug Inspection and Replacement.
- Inspect thermostat visually for corrosion and broken spring. Make sure thermostat closes completely at room temperature.¹
- Check engine fuel filter for contaminants. See Fuel System.
- Check engine timing setup. 1.
- Check corrosion control anodes. Check more frequently when used in salt water. See Corrosion Control Anodes.
- Drain and replace gear case lubricant. See Gearcase Lubrication.
- Lubricate splines on the drive shaft. 1.
- Check and adjust valve clearance, if necessary.¹
- Check power trim fluid. See Checking Power Trim Fluid.
- Inspect battery. See **Battery Inspection**.
- Check control cable adjustments.¹
- Inspect timing belt. See Timing Belt Inspection.
- · Check tightness of bolts, nuts, and other fasteners.

EVERY 300 HOURS OF USE OR THREE YEARS

- Replace water pump impeller (more often if overheating occurs or reduced water pressure is noted).¹
- 1. These items should be serviced by an authorized dealer.

BEFORE PERIODS OF STORAGE

Refer to Storage procedure. See Storage section.

Flushing The Cooling System

Flush the internal water passages of the outboard with fresh water after each use in salt, polluted, or muddy water. This will help prevent a buildup of deposits from clogging the internal water passages.

IMPORTANT: The engine must be run during flushing in order to open the thermostat and circulate water through the water passages.

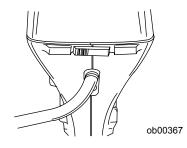
A WARNING

To avoid possible injury when flushing, remove the propeller. Refer to Propeller Replacement.

- 1. Place the outboard in either the operating position (vertical) or in a tilted position.
- 2. Remove propeller. Refer to Propeller Replacement.
- 3. Thread a water hose into the rear fitting. Partially open the water tap (1/2 maximum). Do not open the water tap all the way, as this allows a high pressure flow of water.

IMPORTANT: Do not run engine above idle when flushing.

- 4. Shift outboard into neutral. Start the engine and flush the cooling system for at least 5 minutes. Keep engine speed at idle.
- 5. Stop the engine. Turn off the water and remove hose. Reinstall the propeller.

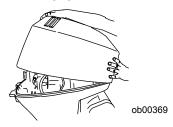


Top Cowl Removal And Installation REMOVAL

1. Unlock the rear latch by pushing lever down.



Lift rear of cowl and disengage front hook.



INSTALLATION

- Engage the front hook and push cowl back over the cowl seal.
- 2. Push cowl down and move the rear latch lever up to lock.

Exterior Care

Your outboard is protected with a durable baked enamel finish. Clean and wax often using marine cleaners and waxes.

Battery Inspection

The battery should be inspected at periodic intervals to ensure proper engine starting capability.

IMPORTANT: Read the safety and maintenance instructions which accompany your battery.

- 1. Turn off the engine before servicing the battery.
- 2. Add water as necessary to keep the battery full.
- 3. Make sure the battery is secure against movement.
- 4. Battery cable terminals should be clean, tight, and correctly installed. Positive to positive and negative to negative.
- 5. Make sure the battery is equipped with a nonconductive shield to prevent accidental shorting of battery terminals.

Fuel System

WARNING

Avoid serious injury or death from gasoline fire or explosion. Carefully follow all fuel system service instructions. Always stop the engine and do not smoke or allow open flames or sparks in the area while servicing any part of the fuel system.

Before servicing any part of the fuel system, stop engine and disconnect the battery. Drain the fuel system completely. Use an approved container to collect and store fuel. Wipe up any spillage immediately. Material used to contain spillage must be disposed of in an approved receptacle. Any fuel system service must be performed in a well ventilated area. Inspect any completed service work for sign of fuel leakage.

FUEL LINE INSPECTION

Visually inspect the fuel line and primer bulb for cracks, swelling, leaks, hardness, or other signs of deterioration or damage. If any of these conditions are found, the fuel line or primer bulb must be replaced.

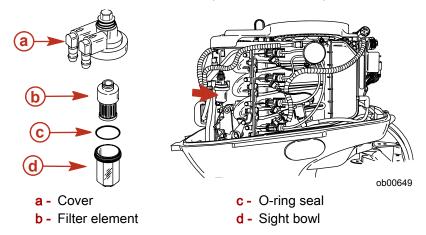
ENGINE FUEL FILTER

Check the fuel filter for water accumulation or sediment. If water is in the fuel, remove the sight bowl and drain the water. If the filter appears to be contaminated, remove and replace.

REMOVAL

- 1. Read Fuel System servicing information and Warning proceeding.
- Pull out the filter assembly from mount. Hold onto the cover to prevent it from turning and remove the sight bowl. Empty contents into an approved container.

3. Pull out the filter element and replace it if necessary.



INSTALLATION

IMPORTANT: Visually inspect for fuel leakage from the filter by squeezing the primer bulb until firm, forcing fuel into the filter.

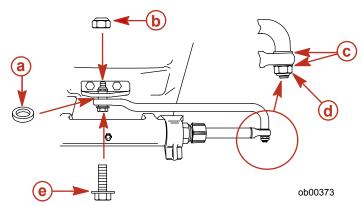
- 1. Push the filter element into the cover.
- 2. Place the O-ring seal into its proper position on the sight bowl, and screw the sight bowl hand tight into the cover.
- 3. Push filter assembly back into mount.

Steering Link Rod Fasteners

IMPORTANT: The steering link rod that connects the steering cable to the engine must be fastened using special washer head bolt ("e" - Part Number 10-856680) and self-locking nylon insert locknuts ("b" & "d" - Part Number 11-826709113). These locknuts must never be replaced with common nuts (non-locking) as they will work loose and vibrate off, freeing the link rod to disengage.

A WARNING

Disengagement of a steering link rod can result in the boat taking a full, sudden, sharp turn. This potentially violent action can cause occupants to be thrown overboard exposing them to serious injury or death.



- **a -** Spacer (12-71970)
- **b** Nylon insert locknut (11-826709113)
- c Flat washer (2)
- **d** Nylon insert locknut (11-826709113)
- e Special washer head bolt (10-856680)

Description	Nm	lb. in.	lb. ft.
Nylon insert locknut "b"	27		20
Nylon insert locknut "d"	Tighten until seats then back off 1/4 turn		
Special washer head bolt	27		20

Assemble steering link rod to steering cable with two flat washers and nylon insert locknut. Tighten locknut until it seats, then back nut off 1/4 turn.

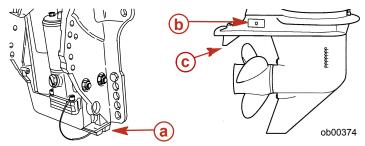
Assemble steering link rod to engine with special washer head bolt, locknut and spacer. First torque bolt, then locknut to specification.

Corrosion Control Anode

Your outboard has corrosion control anodes at different locations. An anode helps protect the outboard against galvanic corrosion by sacrificing its metal to be slowly corroded instead of the outboard metals.

Each anode requires periodic inspection, especially in salt water which will accelerate the erosion. To maintain this corrosion protection, always replace the anode before it is completely eroded. Never paint or apply a protective coating on the anode as this will reduce effectiveness of the anode.

One anode is installed on the bottom of the transom bracket assembly. The trim tab is also an anode on the 87.3 mm (3 - 7/16 in.) diameter gearcase. The 108 mm (4 - 1/4 in.) diameter gearcase has three anodes. One of the anodes is the trim tab, and the other two anodes are located on each side of the gearcase.



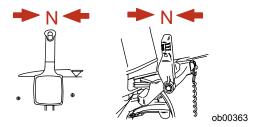
- a Anode on transom bracket assembly
- **b** Anode (2) on each side of gearcase
- c Trim tab

Propeller Replacement - 87.3 mm (3 - 7/16 in.) Diameter Gearcase

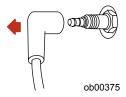
A WARNING

If the propeller shaft is rotated while the engine is in gear, there is the possibility that the engine will crank over and start. To prevent this type of accidental engine starting and possible serious injury caused from being struck by a rotating propeller, always shift outboard to neutral position and remove spark plug leads when you are servicing the propeller.

1. Shift outboard to neutral (N) position.



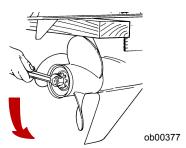
2. Remove the spark plug leads to prevent engine from starting.



3. Straighten the bent tabs on the propeller nut retainer.



- 4. Place a block of wood between gearcase and propeller to hold propeller and remove propeller nut.
- 5. Pull propeller straight off shaft. If propeller is seized to the shaft and cannot be removed, have the propeller removed by an authorized dealer.



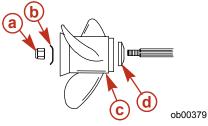
6. Coat the propeller shaft with Quicksilver or Mercury Precision Lubricants Anti-Corrosion Grease or 2-4-C.



Tube Ref No.	Description	Where Used	Part No.
94 (0	Anti-Corrosion Grease	Propeller shaft	92-802867A 1
95 (0	2-4-C	Propeller shaft	92-802859A 1

IMPORTANT: To prevent the propeller hub from corroding and seizing to the propeller shaft (especially in salt water), always apply a coat of the recommended lubricant to the entire propeller shaft at the recommended maintenance intervals, and also each time the propeller is removed.

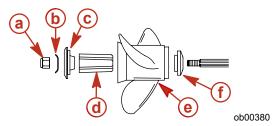
7. Flo-Torq I Drive Hub Propellers - Install forward thrust hub, propeller, propeller nut retainer and propeller nut onto the shaft.



a - Propeller nut

- c Propeller
- **b** Propeller nut retainer
- d Forward thrust hub

8. Flo-Torq II Drive Hub Propellers - Install forward thrust hub, propeller, replaceable drive sleeve, rear thrust hub, propeller nut retainer and propeller nut onto the shaft.



a - Propeller nut

d - Replaceable drive sleeve

b - Propeller nut retainer

e - Propeller

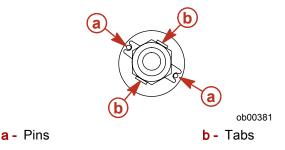
c - Rear thrust hub

f - Forward thrust hub

9. Place propeller nut retainer over pins. Place a block of wood between gearcase and propeller and tighten propeller nut to specifications.

Description	Nm	lb. in.	lb. ft.
Propeller nut	75		55

10. Align flat sides of the propeller nut with tabs on the propeller nut retainer. Secure propeller nut by bending tabs up and against the flats on the propeller nut.



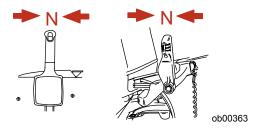
11. Reinstall spark plug leads.

Propeller Replacement - 108 mm (4 - 1/4 in.) Diameter Gearcase

WARNING

If the propeller shaft is rotated while the engine is in gear, there is the possibility that the engine will crank over and start. To prevent this type of accidental engine starting and possible serious injury caused from being struck by a rotating propeller, always shift outboard to neutral position and remove spark plug leads when you are servicing the propeller.

1. Shift outboard to neutral (N) position.



2. Remove spark plug leads to prevent engine from starting.

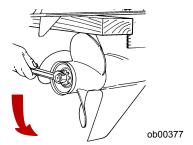


3. Straighten the bent tabs on the propeller nut retainer.

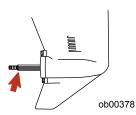


4. Place a block of wood between gearcase and propeller to hold propeller and remove propeller nut.

5. Pull propeller straight off shaft. If propeller is seized to the shaft and cannot be removed, have the propeller removed by an authorized dealer.



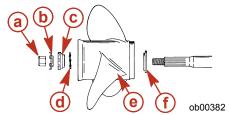
6. Coat the propeller shaft with Quicksilver or Mercury Precision Lubricants Anti-Corrosion Grease or 2-4-C.



Tube Ref No.	Description	Where Used	Part No.
94 🔘	Anti-Corrosion Grease	Propeller shaft	92-802867A 1
95 🗀	2-4-C	Propeller shaft	92-802859A 1

IMPORTANT: To prevent the propeller hub from corroding and seizing to the propeller shaft (especially in salt water), always apply a coat of the recommended lubricant to the entire propeller shaft at the recommended maintenance intervals, and also each time the propeller is removed.

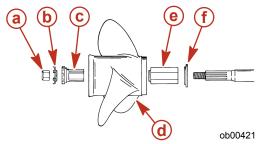
7. Flo-Torq I Drive Hub Propellers - Install thrust washer, propeller, continuity washer, thrust hub, propeller nut retainer, and propeller nut onto the shaft.



- a Propeller nut
- **b** Propeller nut retainer
- c Thrust hub

- d Continuity washer
- e Propeller
- f Thrust washer

8. Flo-Torq II Drive Hub Propellers - Install forward thrust hub, replaceable drive sleeve, propeller, thrust hub, propeller nut retainer and propeller nut onto the shaft.

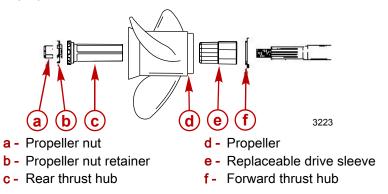


- a Propeller nut
- **b** Propeller nut retainer
- c Thrust hub

- d Propeller
- e Replaceable drive sleeve
- f Forward thrust hub

NOTE: Stainless Steel Applications - Installation of a Flo-Torq III drive hup propeller is recommended.

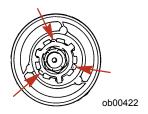
9. Flo-Torq III Drive Hub Propellers - Install forward thrust hub, replaceable drive sleeve, propeller, thrust hub, propeller nut retainer and propeller nut onto the shaft.



10. Place a block of wood between gearcase and propeller and torque propeller nut to specifications.

Description	Nm	lb. in.	lb. ft.
Propeller nut	75		55

11. Secure propeller nut by bending three of the tabs into the thrust hub grooves.



Spark Plug Inspection And Replacement

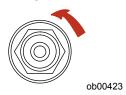
A WARNING

Avoid serious injury or death from fire or explosion caused by damaged spark plug boots. Damaged spark plug boots can emit sparks. Sparks can ignite fuel vapors under the engine cowl. To avoid damaging spark plug boots, do not use any sharp object or metal tool such as pliers, screwdriver, etc. to remove spark plug boots.

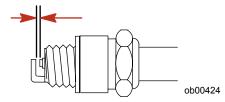
 Remove the spark plug boots. Twist the rubber boots slightly and pull off.



2. Remove the spark plugs to inspect. Replace spark plug if electrode is worn or the insulator is rough, cracked, broken, blistered or fouled.



3. Set the spark plug gap to specification.



Spark Plug	
Spark plug gap	1.0 mm (0.040 in.)

4. Before installing spark plugs, clean off any dirt on the spark plug seats. Install plugs finger tight, and then tighten 1/4 turn or torque to specifications.

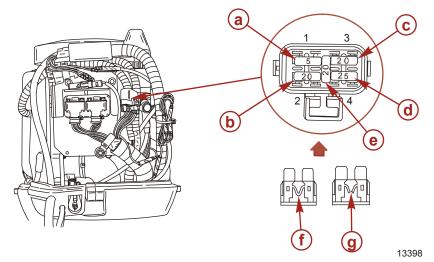
Description	Nm	lb. in.	lb. ft.
Spark plug	27		20

Fuse Replacement

IMPORTANT: Always carry spare 20 AMP fuses.

The electrical wiring circuits on the outboard are protected from overload by fuses in the wiring. If a fuse is blown, try to locate and correct the cause of the overload. If the cause is not found, the fuse may blow again.

Open the fuse holder and look at the silver colored band inside the fuse. If band is broken, replace the fuse. Replace fuse with a new fuse with the same rating.

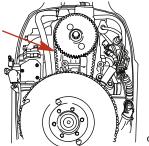


- a SmartCraft data bus circuit 5 AMP fuse
- **b** Fuel pump/idle air control/fuel injector circuits SFE 20 AMP fuse
- c Main relay/accessories 20 AMP fuse
- d Ignition coil circuit 25 AMP fuse
- e Spare 20 AMP fuse
- f Good fuse
- g Blown fuse

Timing Belt Inspection

- 1. Inspect the timing belt and have it replaced by an authorized dealer if any of the following conditions are found.
 - a. Cracks in the back of the belt or in the base of the belt teeth.
 - b. Excessive wear at the roots of the cogs.
 - c. Rubber portion swollen by oil.
 - d. Belt surfaces roughened.

e. Signs of wear on edges or outer surfaces of belt.



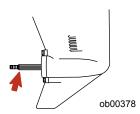
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Lubrication Points

1. Lubricate the following with Quicksilver or Mercury Precision Lubricants Anti-Corrosion Grease or 2-4-C.

Tube Ref No.	Description	Where Used	Part No.
94 (0	Anti-Corrosion Grease	Propeller shaft	92-802867A 1
95 🗀	2-4-C	Propeller shaft	92-802859A 1

 Propeller Shaft - Refer to Propeller Replacement for removal and installation of the propeller. Coat the entire propeller shaft with lubricant to prevent the propeller hub from corroding and seizing to the shaft.

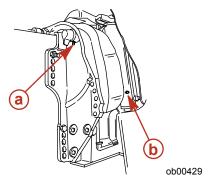


2. Lubricate the following with Quicksilver or Mercury Precision Lubricants 2-4-C or Special Lubricant 101.

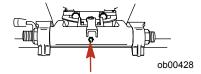
Tube Ref No.	Description	Where Used	Part No.
95 🗀	2-4-C	Tilt support lever, swivel bracket, tilt tube, steering cable grease fitting	92-802859A 1

Tube Ref No.	Description	Where Used	Part No.
34 0	Special Lubricant 101	Tilt support lever, swivel bracket, tilt tube, steering cable grease fitting	92-802865A 1

- · Tilt Support Lever Lubricate through fitting.
- · Swivel Bracket Lubricate through fitting.



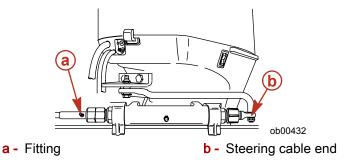
- a Tilt support lever
- **b** Swivel bracket
- · Tilt Tube Lubricate through fitting.



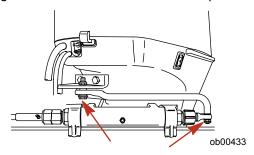
WARNING

The end of the steering cable must be fully retracted into the outboard tilt tube before adding lubricant. Adding lubricant to steering cable when fully extended could cause steering cable to become hydraulically locked. A hydraulically locked steering cable will cause loss of steering control, possibly resulting in serious injury or death.

Steering Cable Grease Fitting (If equipped) - Rotate steering wheel
to fully retract the steering cable end into the outboard tilt tube.
Lubricate through fitting.

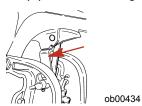


- 3. Lubricate the following with light weight oil.
 - · Steering Link Rod Pivot Points Lubricate points.

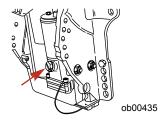


Checking Power Trim Fluid

1. Tilt outboard to the full up position and engage the tilt support lock.



Remove fill cap and check fluid level. The fluid level should be even
with the bottom of the fill hole. Add Quicksilver or Mercury Precision
Lubricants Power Trim & Steering Fluid. If not available, use
automotive (ATF) automatic transmission fluid.

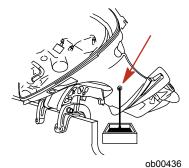


Changing Engine Oil ENGINE OIL CAPACITY

3.0 Liter (3 U.S. Quarts).

OIL CHANGING PROCEDURE

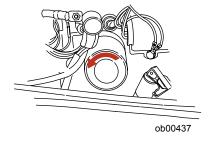
- 1. Tilt the outboard up to the trailer position.
- Turn the steering on the outboard so that the drain hole is facing downward. Remove drain plug and drain engine oil into an appropriate container. Lubricate the seal on the drain plug with oil and reinstall.



CHANGING OIL FILTER

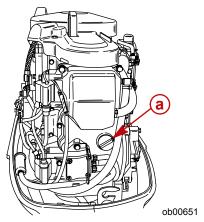
- 1. Place a rag or towel below the oil filter to absorb any spilled oil.
- 2. Unscrew old filter by turning the filter to the left.

3. Clean the mounting base. Apply film of clean oil to filter gasket. Do not use grease. Screw new filter on until gasket contacts base, then tighten 3/4 to 1 turn.



OIL FILLING

- 1. Remove the oil fill cap and add oil to proper operating level.
- Idle engine for five minutes and check for leaks. Stop engine and check oil level on dipstick. Add oil if necessary.



a - Oil fill cap

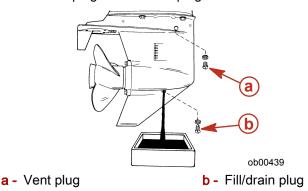
Gearcase Lubrication - For 87.3 mm (3-7/16 in.) Diameter Gearcase

When adding or changing gearcase lubricant, visually check for the presence of water in the lubricant. If water is present, it may have settled to the bottom and will drain out prior to the lubricant, or it may be mixed with the lubricant, giving it a milky colored appearance. If water is noticed, have the gearcase checked by your dealer. Water in the lubricant may result in premature bearing failure or, in freezing temperatures, will turn to ice and damage the gearcase.

Examine the drained gearcase lubricant for metal particles. A small amount of fine metal particles indicates normal gear wear. An excessive amount of metal filings or larger particles (chips) may indicate abnormal gear wear and should be checked by an authorized dealer.

DRAINING GEARCASE

- 1. Place outboard in a vertical operating position.
- 2. Place a drain pan below outboard.
- 3. Remove vent plug and fill/drain plug and drain lubricant.



GEARCASE LUBRICANT CAPACITY

Gearcase lubricant capacity is approximately 340 ml (11.5 fl. oz.).

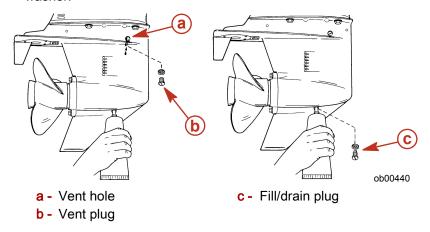
CHECKING GEARCASE LUBRICANT LEVEL AND REFILLING GEARCASE

- 1. Place outboard in a vertical operating position.
- 2. Remove vent plug.
- 3. Place lubricant tube into the fill hole and add lubricant until it appears at the vent hole.

IMPORTANT: Replace sealing washers if damaged.

4. Stop adding lubricant. Install the vent plug and sealing washer before removing the lubricant tube.

5. Remove lubricant tube and reinstall cleaned fill/drain plug and sealing washer.



Gearcase Lubrication - For 108 mm (4 - 1/4 in.) Diameter Gearcase

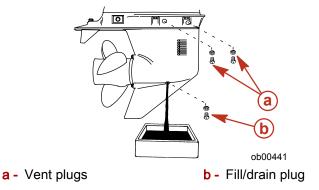
When adding or changing gearcase lubricant, visually check for the presence of water in the lubricant. If water is present, it may have settled to the bottom and will drain out prior to the lubricant, or it may be mixed with the lubricant, giving it a milky colored appearance. If water is noticed, have the gearcase checked by your dealer. Water in the lubricant may result in premature bearing failure or, in freezing temperatures, will turn to ice and damage the gearcase.

Examine the drained gearcase lubricant for metal particles. A small amount of fine metal particles indicates normal gear wear. An excessive amount of metal filings or larger particles (chips) may indicate abnormal gear wear and should be checked by an authorized dealer.

DRAINING GEARCASE

- 1. Place outboard in a vertical operating position.
- 2. Place a drain pan below outboard.

3. Remove vent plugs and fill/drain plug and drain lubricant.



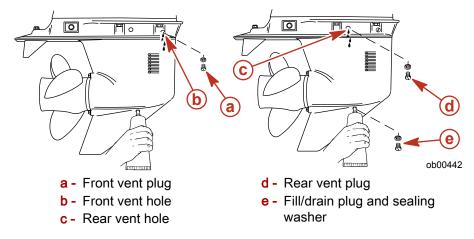
GEARCASE LUBRICANT CAPACITY

Gearcase lubricant capacity is approximately 710 ml (24 fl. oz.).

CHECKING LUBRICANT LEVEL AND FILLING GEARCASE

- 1. Place outboard in a vertical operating position.
- 2. Remove the front vent plug and rear vent plug.
- 3. Place lubricant tube into the fill hole and add lubricant until it appears at the front vent hole. At this time install the front vent plug and sealing washer.
- 4. Continue adding lubricant until it appears at the rear vent hole.
- 5. Stop adding lubricant. Install the rear vent plug and sealing washer before removing lubricant tube.

Remove lubricant tube and reinstall cleaned fill/drain plug and sealing washer.



Submerged Outboard

A submerged outboard will require service within a few hours by an authorized dealer once the outboard is recovered from the water. This immediate attention by a servicing dealer is necessary once the engine is exposed to the atmosphere to minimize internal corrosion damage to the engine.